

very rare in Floyd county. I have no late records of it here, though I saw a single specimen in southeastern Cerro Gordo county, May 28th.

83. *Strix pratincola*—Barn Owl. Rather uncommon of late years, though plentiful as late as 1881, according to a note made by Mr. W. C. Miles of Charles City. A pair nested in Charles City in 1914, and for a short time I had one of the young ones, which had fallen from the nest.

84. *Asio wilsonianus*—Long-eared Owl. An uncommon resident. The Charles City high school possesses a specimen taken near Rockford in 1904.

85. *Asio flammeus*—Short-eared Owl. Quite common, nesting in swampy districts near Floyd; north of Charles City, and in other parts of the county. Specimens are quite often taken, especially in autumn.

86. *Strix varia varia*—Barred Owl. This species is quite common. They are often shot, merely because they are owls. My last observation is March 27th, 1916.

87. *Cryptoglaux funerea richardsoni*—Richardson's Owl. I found one specimen of this owl north of Floyd, July 14th, 1915. The body had been crushed by an auto, but served for identification, though worthless as a specimen. A specimen was taken near Osage in 1914, and Mrs. F. May Tuttle saw a specimen in Osage March 25th, 1916.

88. *Megascops asio asio*—Screech Owl. A common resident. Both grey and red phases are common, though the former is somewhat the more plentiful of the two.

89. *Bubo virginianus virginianus*—Great Horned Owl. Uncommon in Floyd county. My last observation is September 23d, 1914. A specimen was taken near Charles City in October, 1915.

90. *Nyctea nyctea*—Snowy Owl. A rare winter resident. During the last five years I have seen this species but once, December 23d, 1913, south of Charles City.

NOTES ON THE BREEDING WARBLERS OF TENNESSEE.

BY A. F. GANIER.

It is a general supposition that our warblers, with few exceptions, pass through the south as migrants and to a northern clime in search of a place to breed. Hence the following notes on sixteen species of Mniotiltidæ found in middle Ten-

nessee during the breeding season should prove of interest.

Middle Tennessee is neither flat nor swampy like west Tennessee, nor is it mountainous and rugged like the eastern part of the state. Instead, it ranges from rolling to hilly, well watered and has an average sea level elevation of six or seven hundred feet. It is a bluegrass region, similar to that of central Kentucky, while its fauna and flora are that of the Carolinian zone.

Pending a more thorough investigation of the status of the warblers in this section I shall confine this paper principally to a four-day trip, made by Dr. G. R. Mayfield and the writer, to Sulphur Springs, about twenty miles west of Nashville, from June 4 to 8, 1916.

The location of our outing was chosen on account of the great diversity of its topography, including as it did the Cumberland River, with its valley a mile wide, overlooked by precipitous limestone cliffs, some two hundred feet higher than the valley, the altitude of the latter being about four hundred feet. Back of the bluffs were dense woodlands of hardwood, well watered by springs and an ideal breeding ground for most of the warblers noted. Marrowbone Creek, a gravel bottomed stream of fairly good proportions, flowed into the river here and its clear waters and sycamore lined banks were the principal home of the water-thrushes and sycamore warblers noted.

The annotated list follows, specimens of the least common species being collected and preserved in the shape of skins.

Black and White Warbler—*Mniotilta varia*.

Doubtless the commonest warbler we found and readily noted on account of its habit of feeding low about the tree trunks. Many young of the year were noted, there being usually a group of three or four together. An inhabitant of the denser woodland.

Prothonotary Warbler—*Protonotaria citrea*.

Five or six pairs were located on Marrowbone Creek from the railroad bridge to the mouth, a half mile below. A lock and dam built in the river nearby has caused the water on this stretch to remain constant except of course in time of floods, and the place is ideal for their requirements. A number of nest holes were ex-

amined but the young had taken leave and no second sets were found. Two other pair were noted on the river a mile farther up-stream. The birds are most unsuspecting, several approaching to within a few feet of our boat as they fed among the bushes just above the water's surface.

Worm-eating Warbler—*Helmitheros vermivorus*,

Fairly common in the dense woodland. All birds noted were on or near the ground and usually not far from the small brooklets. Young of the year were already abroad but were still being fed by the parents.

Northern Parula Warbler—*Compsothylpis americana usneæ*.

About half a dozen were seen and heard and two males secured. There is no hanging moss in Middle Tennessee in which these birds could nest, hence it would be of interest to know how they have adapted themselves to the situation.

Yellow Warbler—*Dendroica æstiva æstiva*.

Two males were seen and heard singing among the brush along the river bank. Their scarcity in the vicinity was a matter of comment since they were fairly common about Nashville.

Cerulean Warbler—*Dendroica cerulea*.

Common in the dense woods, keeping to the upper branches of the larger trees. On account of this habit and its small size it could only be located by its song.

Sycamore Warbler—*Dendroica dominica albiflora*,

Some six or eight singing males were noted along the three mile stretch of Marrowbone Creek over which we tramped. The birds fed among the high branches of the sycamore trees, their notes reminding one much of the song of the indigo bunting. Their movements are deliberate and for this reason they are hard to locate.

Kentucky Warbler—*Oporonis formosus*.

Fairly common in the woodlands, chiefly near the edges and about the open places. A young of this species, which had recently left the nest, was located among some bushes and my observations caused the greatest anxiety among the parent birds.

Hooded Warbler—*Wilsonia citrina*.

A bit more common than the former, showing a preference for the thickest part of the woodland and usually found on or near the ground.

Oven-bird—*Seiurus aurocapillus*.

Three pair were located in the woodland, being the first we had

had the pleasure of recording here during the breeding season. Excepting in the higher altitudes of the southern Alleghenies, this is the furthest south this species has been recorded in summer.

Louisiana Water-Thrush—*Seiurus motacilla*.

Fairly common in the deep woods along the little rock bottom spring branches and along Marrowbone Creek wherever the stream comes in contact with steep wooded hillsides which offer a nesting site above flood water. A nest with four almost fresh eggs was found beautifully located on a ledge of rock and hidden by a spray of fern. The parent bird slipped off the nest when I had approached to within thirty feet and ran along the spring branch ahead of me. This was doubtless a second set, since a young of the year in almost mature plumage was taken on the same day.

Maryland Yellow-throat—*Geothlypis trichas trichas*.

Quite common here as elsewhere. Found along the ditches, in the briar patches, and by the barrow pits along the railroad track. A singing male was nearly always within earshot. One which had taken up it's headquarters within fifty feet of the house where we stayed, began his ditty at daybreak and proved such a menace to our morning sleep that we were sorely tempted to shoot him.

Yellow-breasted Chat—*Icteria virens virens*.

Fairly common among the briar patches. Late in the afternoon all the males mount to a conspicuous perch and sing till dusk. Their rich yellow breasts surmounting the pinnacle of some sapling makes them conspicuous for quite a distance.

Redstart—*Setophaga ruticilla*.

This little firebrand of the woodland was noted hardly often enough to be called fairly common. Always flitting from tree to tree, catching flies in midair, with somersaults and loop-the-loops, spreading his tail between times, this is a fascinating little bird to watch. They are unsuspecting and will approach at times to within a few feet of the observer.

The fourteen warblers above, noted at Sulphur Springs, include all but two which I have recorded in middle Tennessee during the breeding season. The two species below have been recorded at Kingston Springs, about ten miles south of the above locality and in a region whose topography was exactly the same.

Blue-winged Warbler—*Vermivora pinus*.

Three records made during 1916 may mean that this bird will prove to be fairly common. On June 24, an immature bird was taken from a group of three on a brushy hillside. On July 1st an

immature was taken and it was accompanied by another of the same species. These were in a small brush patch in an open field. On July 14, a single bird was noted in a sapling at the edge of a field.

Pine Warbler—*Dendroica vigorsi vigorsi*.

Quite a colony has been located in a small belt of scrub pine trees which fringe the cliffs overlooking Turnbull Creek near where it flows into Harpeth River. This pine grove is three-quarters of a mile long and from fifty to one hundred and fifty feet in width. It was first noted here on June 6, 1915, when a single specimen was seen and secured. The bird was a mature male and was much soiled with pitch. I visited the grove again on July 4, 1916, accompanied by Prof. A. C. Webb and Dr. Mayfield, and was agreeably surprised to find about twenty-five of the birds feeding among the pines. Three specimens were taken and all proved to be birds of the year. A thin fringe of pines along the cliffs at Sulphur Springs was examined, but no pine warblers were in evidence.

Other warblers which I hope to add to the above list of summer species are the Prairie, Swainson's, Bachman's, Black-throated Green, and possibly Cairn's. I shall not be surprised to find the first named fairly common, tho of local distribution. The Swainson's I have taken 65 miles west of here on Sept. 7, in a swamp in which I have every reason to believe is its summer home. Lack of time has prevented me from investigating earlier in the season. I have taken the Prairie as early as August 30th and the Black-throated Green as early as August 23, which might indicate breeding birds.

Before concluding this paper I shall add a list of the other birds noted at Sulphur Springs during the four days of our stay: Great Blue Heron 2, Green Heron 2, Killdeer 1, Bob-white, fairly common, Dove, common, Black Vulture c, Turkey Vulture f. c., Cooper's Hawk 1, Red-tailed Hawk 1, Sparrow Hawk 1, Screech Owl 3, Yellow-billed Cuckoo f. c., Belted Kingfisher 4, Southern (?) Hairy Woodpecker 3, Southern Downy Woodpecker f. c., Pileated Woodpecker 6, Red-bellied Woodpecker f. c., Northern Flicker c., Whip-poorwill 1, Chimney Swift f. c., Ruby-throated Hummingbird 6, Kingbird f. c., Crested Flycatcher c., Acadian Flycatcher f. c., Phoebe f. c., Wood Pewee, abund., Blue Jay c., Crow c., Red-winged Blackbird 6, Meadowlark 4, Baltimore Oriole 2, Orchard Oriole 5, Bronzed Grackle f. c., Goldfinch c., Chipping Sparrow c., Field Sparrow c., Towhee f. c., Cardinal a., Indigo Bunting a., Summer Tanager c., Purple Martin f. c., Rough-winged Swallow 6,

Red-eyed Vireo a., White-eyed Vireo c., Yellow-throated Vireo c., Warbling Vireo 1, Mockingbird c., Catbird f. c., Brown Thrasher f. c., Carolina Wren a., Bewick's Wren f. c., White-breasted Nuthatch f. c., Tufted Titmouse c., Carolina Chickadee c., Blue-gray Gnatcatcher f. c., Wood Thrush 4, Southern Robin 4, Bluebird c., Cedar Waxwing 20 (two flocks).

The above, added to the fourteen species of warblers already mentioned, brings the last up to seventy-three species, all of which, with the exception of the Cedar Waxwing, were breeding birds.

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THE MAY BIRD CENSUS FOR 1916

The following belated reports were not in the editor's hands time to appear in the June issue.

New Haven, Conn., May 20, 4:30 to 9 A. M. 11 A. M. to 4:30 P. M. Clear. Wind southwest, light, Temperature at 8 A. M. 50°. Green Heron, 4; Black-crowned Night Heron, 2; Spotted Sandpiper, 1; Red-shouldered Hawk, 1; Sparrow Hawk, 2; Black-billed Cuckoo, 3; Belted Kingfisher, 2; Downy Woodpecker, 5; Red-headed Woodpecker, 1; Flicker, 9; Nighthawk, 1; Chimney Swift, 27; Ruby-throated Hummingbird, 1; Kingbird, 6; Phoebe, 11; Wood Pewee, 1; Least Flycatcher, 4; Blue Jay, 10; Crow, 24; Fish Crow, 3; Bobolink, 6; Cowbird, 16; Red-winged Blackbird, 32; Meadowlark, 15; Baltimore Oriole, 14; Orchard Oriole, 4; Purple Grackle, 17; Goldfinch, 24; Grasshopper Sparrow, 1; Chipping Sparrow, 13; Field Sparrow, 18; Song Sparrow, 36; Swamp Sparrow, 1; Towhee, 21; Rose-breasted Grosbeak, 12; Indigo Bunting, 7; Scarlet Tanager, 6; Barn Swallow, 21; Tree Swallow, 1; Red-eyed Vireo, 6; Yellow-throated Vireo, 2; Black and White Warbler, 9; Chestnut-sided Warbler, 15; Bay-breasted Warbler, 12; Black-poll Warbler, 17; Blackburnian Warbler, 12; Black-throated Green Warbler, 10; Prairie Warbler, 6; Oven-bird, 19; Water-Thrush, 4; Louisiana Water-Thrush, 1; Maryland Yellowthroat, 22; Yellow-breasted Chat, 14; Hooded Warbler, 1; Wilson's Warbler, 4; Canada Warbler, 15; Redstart, 16; Catbird, 26; Brown Thrasher, 19; House Wren, 8; Wood Thrush, 10; Veery, 9; Gray-cheeked Thrush, 2; Olive-backed Thrush, 5; Robin, 36; Bluebird, 5. Total 74 species and 763 individuals. The following twenty species have also been seen within a week of this date, but not on this day; Loon, Herring Gull, Old-squaw, Least Sandpiper, Solitary Sandpiper, Broad-winged Hawk, Mourn-